

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

NO. 22

DECEMBER 22, 1933

EXECUTIVE AND PERSONNEL
MANAGEMENT
ON THE
NATIONAL FORESTS



A MEDIUM FOR THE EXCHANGE OF IDEAS AND
EXPERIENCES BY OPERATING EXECUTIVES
FOR THE BETTERMENT OF THE
SERVICE

CONFIDENTIAL - FOR SERVICE MEMBERS ONLY

U. S. F. S. RECEIVED
LIBRARY
MAY 22 1935

U. S. F. S. RECEIVED
LIBRARY
MAY 10 1934

CONTENTS

	PAGE
Game Management—Foreword	
By Peter Keplinger.....	3
Game Management on the National Forests Under the New Deal	
By Robert R. Hill.....	6
Reviews	
Wild-Life Conservation.....	12
The Mechanism of Game Management.....	14
Suggestions for Discussion.....	16
Discussion of Lesson 20.....	18
By Victor H. Frey.....	18
K. Wolfe.....	19
Donald E. Clark.....	20
T. E. Price.....	21
Stanley F. Wilson.....	21
H. H. Herndon.....	21
P. V. Woodhead.....	22
Paul D. Irwin.....	22
Andrew Hutton.....	23
J. N. Templer.....	23

GAME MANAGEMENT — FOREWORD

by

PETER KEPLINGER

When I was given the assignment of preparing a series of lessons on game management, I thought it would be easy—that game management was a field so well covered that all I would have to do would be to assemble a bit of material from well-known authorities; but now that it is time to begin I scarcely know where I am at. There is a world of material on game and sportsmanship and wild life and generalities about the *need* both for better management and more game, but very, very little on how to manage. The tendency now seems to be more toward “wild-life” management, with the management consisting mostly of talk. That is, game management is just about to but has not quite reached that stage of development where “management” will mean things to do—jobs. In the past it has meant mostly restrictions, prohibitions, and propaganda.

Further, what management there has been in the past I find has been mostly wrong, and almost all my old ideas will have to be discarded. For example, take that good old standby, the “balance of nature.” I have always thought we had to be careful about “disturbing the balance,” but I find now that there never was one. Nature did not balance; it was a big seesaw. Rabbits would become plentiful; then with a good food supply coyotes would increase, but as they increased the rabbits decreased until finally the coyotes starved out. Or the bugs would kill all the pine trees. With no trees the bugs could not exist. With the bugs gone the trees would come back, and so on and on, up and down, but never balancing.

Then there was my idea about fish. I thought that the way to have good fishing was to plant lots of fry, or better yet, use “retaining ponds.” I find now that both methods are wasteful makeshifts, and that the same money spent on stream improvement will produce a lot more fish. Likewise with refuges, another makeshift. So, too, with fire. While fire sometimes destroys game, without it there would be very little. Neither intensive silviculture nor the climax type in plant succession produces good game range.

But before we go any further perhaps we should get together on what we are talking about. What is game? What is the objective in game management? And what do we mean by “management”? According to Leopold, game is a wild animal hunted for sport. Without hunting there is no game, no matter how many deer you have. If hunted only for the meat or the teeth, there is no game; there must be as a controlling factor, sport. Then hunting for *sport* is the objective in all game management.

I just read a bunch of Elk management plans. Since only one or two provide for hunting, only one or two could properly be called “game” plans, that is if we accept the above definition. The effect of removing the game idea from

wild-life planning will be commented on later.

Management is more difficult to define. Management implies an act-doing something. What? Again quoting from Leopold, management consists in so manipulating environment factors as to increase the yield of game *in the bag*. It includes the crop idea. Without it, it is like forestry in New York. Also it includes manipulation of factors. In forest management you manipulate the factors so as to increase the crop. A wild forest is low in production. There were areas where by accident good stands were produced but the average yield of wild forests was low. This I find was also true of game. Some wild-lifers tell us about the abundance of game before the white man came, but the experts tell us this is a myth. For example, I find that in pioneer days the accidental **alignment of the use of axe, plow, and fire** so favorably modified the game environment that there was produced a "wealth of game far greater than the red man ever saw." In our timber sales and stand improvement work we, through the use of the axe in removing the undesirable, in spacing and in choosing seed trees, also through slash burning, so manipulate the environment as to favor white pine or douglas fir or whatever it is we want, and ultimately will greatly increase the yield—the wood material taken for use. Likewise through manipulation we may create or improve an environment favorable to deer or quail, or whatever crop we want, and thereby increase the yield far beyond wild conditions.

When the forestry agitation was young in this country, the demand was to "save the trees," which was often interpreted to mean "save the trees through non-use." You can remember many times when our work on the National Forests was criticized on the basis that we were doing the same thing the lumberman had done, cutting—destroying—the trees. But we now have more trees than then. We are producing a crop and at the same time increasing the yield. Protection alone gets you nowhere. There is no yield, and not even a desirable stand. Then, too, we used to hear a lot about makeshifts, such as diameter limits—better than nothing, but certainly not scientific, and therefore not forestry.

Further, we are told that the tools we use to improve game are the same as those used in its destruction—the axe, plow, fire, gun, and grazing. Not much different from the tools of a forester. In extensive forestry there is little that can be done, hence the environment is modified only slightly; in intensive forestry a good many things are done, the environment is considerably modified and the crop is greatly increased. The same seems to hold for game management. One of the problems is to determine how much it pays to do in any particular situation.

As to the lessons I am to try to prepare, what I propose to do is to bring to you, either through reviews or references, some of the views of experts and leaders in the movement, with which I think you would like to be familiar and may not have time to find for yourself. Further, I propose to comment and criticize in my own way as an outsider, that is as one who is neither expert nor manager. What I say should never be interpreted as representing the

Branch office handling game for the Service. What I am trying to discover are methods, principles, ideas, not official regulations or instructions. Further than that we will continue the discussion feature as used in the past, which gives you an opportunity to say how you think it ought to be done, as well as comment on how you are doing it.

Your work in the past has on most Forests been necessarily extensive. The indications are that in the future it will become much more intensive. The new era will provide more leisure, or at least better distributed leisure. With more leisure men will hunt more, that is if there is game to hunt. Or they, the people with leisure, may demand more game from you, their manager—or part manager co-operating with a State. It has already been proposed in Congress that there be a technical game manager on each Forest. That idea will grow. But what about it? Do you need him, and what will he do? We do not want to answer such questions hastily, but together perhaps we can examine the situation critically and be prepared for the new conditions as they develop. If you have any suggestions as to how we can co-operatively get the most out of this study, I am open to suggestion. Send your suggestions direct to me, either for or not for publication. The course is not yet planned. My present idea is that we will devote two or three lessons to game, then perhaps one to wild life, one to fur bearers, and possibly two to fish. There seems to me to be more opportunity for intensive work with fish than with other game, but I do not pretend to know.—P. K.

GAME MANAGEMENT ON THE NATIONAL FORESTS UNDER THE NEW DEAL

by

ROBERT R. HILL

[NOTE: The writer thinks he has uncovered one of the tricks in Kep's bag. He apparently delegates the job of writing the leading article to someone who doesn't know too much about the subject, so that there will be a fertile field for criticism and discussion.]

Joe Fitzland is a Government clerk who takes his work seriously, but likes his bridge, tennis, and skiing—even as you and I. He talks about these subjects quite sanely; but if you start down the street with Joe and the subject of *ducks* comes up, you had better watch out for traffic, because Joe won't. I don't see how he distinguishes between a russet duck, on which there is a closed season, and a green-headed mallard, because he sure can't tell the difference between red and green traffic lights. Joe admits his weakness is ducks. But I wonder if most everyone doesn't have a similar but perhaps more or less inhibited zeal for hunting or fishing or for just getting close to things in the wild. Anyhow some forty-five million of us do manage to get into the open each year.

We hear a great deal about the increased leisure time that is bound to result from the adjustments in employment that must accompany the reorganization of economic life to fit conditions in this mass-production, machine era. Because outdoor recreation pays such dividends in good health—mental and physical—and because it has an almost universal appeal, it is bound to play a most important part in the recreational programs that will be fostered to an increasing extent by communities, States, and the Federal Government. The opportunity to hunt, to fish, to study wild life in its various forms, is an essential feature of recreation in the National Forests. To manage the wild-life resources so as to make them contribute as fully as possible to the growing demand for healthy outdoor recreation is a primary function of National Forest administration.

One of the prominent features of the New Deal is its program for land-use planning. This is exemplified in the Tennessee Valley Development project and in the frequent references by Secretary Wallace to "Planned Agriculture," "Controlled Production," etc. It is significant that the man who had most to do with the legislation which made the Tennessee project possible now proposes to have a similar program developed for the Missouri watershed. It is possible that the stimulus given to land-use planning will permanently affect the administration of the National Forests in a more vital way than any other feature of the New Deal. Its influence is seen in the ready acceptance of the sustained yield objective in the tentative Lumber Code under the National Recovery Act. The principle is not new in National Forest administration. In fact, wise land use is basic in all forest resource management plans. But in view of the fact that the Forest Service depends upon public support in the

application of management plans it is highly important that the public accept the principle of regulated use of natural resources. This is vitally important in the management of the wild-life resources. We cannot determine the extent to which wild-life resources should be developed until it is possible to correlate the use of forage by game animals with the use by domestic stock. The proportion of range that should be allocated to domestic animals cannot be determined without considering the whole problem of livestock production on western ranges, on cultivated farms, etc., in relation to the demand for livestock products and in relation to other desirable uses to which the lands may be put. It is possible that a comprehensive land-use program would provide that more livestock should be produced on farms in the corn belt and that larger areas of western range lands should be devoted primarily to watershed protection and the development of wild life. In any event, we need to know the possibilities of economic livestock production before deciding whether game or livestock should be favored in the management of National Forest lands. While we have been inclined to go on the assumption that both domestic stock and game animals could occupy the same range, we realize that sooner or later the maximum capacity will be reached and a limitation must be placed on further increases by one class or the other. We are being pressed in numerous instances to decide which class of animals we will favor. We cannot long avoid the issue.

One question that has an important bearing on the problem is, what constitutes an adequate supply of game animals? Should a deer be provided for every hunter? Should the number of wild animals be restricted to those required to satisfy the aesthetic needs? Should the carrying capacity of the range be divided between game and domestic stock on the basis of economic needs? We cannot expect general agreement on answers to these questions. We are safe in assuming that an adequate supply of meat and livestock products is of greater importance than an abundant supply of game. However, if an adequate supply of beef and mutton can be produced economically in Iowa and other farming States, a strong case can be presented in favor of replacing domestic stock with game on the ranges of Colorado. This does not imply, of course, that livestock enterprises should be confiscated in order to provide range for game. As a matter of policy, wherever adjustments of this kind are considered, provision should be made whereby those who will be benefited will compensate those whose property will be depreciated.

Fortunately for administrators of the National Forests, the ultimate objective as to numbers of game animals need not be set up in management plans. It is important, however, that administrative policies be guided by certain considerations, such as:

(1) The greatest good to the greatest number as applied to this problem should be determined by careful land-use, economic and social surveys.

(2) The productivity of the soil and watershed conservation are paramount to any other objectives in land management.

(3) Production of food and clothing, unless provided for elsewhere, is more essential than the development of recreation.

- (4) Provision for recreation is a very high use of public resources.
- (5) Those who benefit should compensate those whose interests suffer.

If such considerations guide our administrative policies, it is believed the wild-life resources will contribute as fully as practicable to the public welfare.

It is generally recognized that division of responsibility between individual States and the Federal Government is a serious handicap in the management of wild-life resources on the National Forests. The question of ownership of wild life on Federal lands within the States has not been settled by the Supreme Court. Ownership is assumed by the States, so we have the anomaly of States exercising control over animals that feed on Federal property. Many conservationists feel that satisfactory management of the game or of the lands cannot be effected so long as this division of responsibility continues. The position of the Forest Service has been that the theory of ownership is unimportant; *i. e.*, whether ownership rests with the citizens of the States or of the United States, but it is essential that the control of wild life be fitted into the need for efficient management of that and related resources. The Forest Service favors local control over the management of wild life to the extent that it can be exercised efficiently. For that reason it has encouraged co-operation between Forest officers and local game officials and associations in the development of plans which provide for the greatest amount of sport and at the same time the adequate conservation of the resources involved. Where the management of wild life does not conflict with the management of other resources, the control over wild animals can be exercised without serious complications by an agency not responsible for the administration of related resources. However, as the inevitable conflict between game and domestic stock, and between grazing and conservation of soil and watershed, becomes serious, it is of more and more importance that responsibility for the management of all the interests involved be centered in one agency. Since the Forest Service is responsible for the protection and conservation of the basic resources, it is clearly essential that this agency exercise effective control over the development of wild life. In reality there should be no disagreement between State game authorities and Forest officers with respect to essential objectives. Both agencies are interested in developing wild-life resources as fully as practicable and in having the resources contribute as fully as possible to the needs of local communities. It is clearly the responsibility of the Forest Service to determine the extent to which game animals shall be allowed to consume forage used in common with domestic stock; the extent to which streams and lakes shall be used for fish production. It is likewise the responsibility of the Forest Service to determine the number of game animals that may be removed each year and the number of fish that may be caught. Exercise of this authority is essential to efficient land management. The Forest Service now exercises similar authority in the management of other National Forest resources. The only difference between them and wild-life resources concerns the theory of ownership. Advocates of State ownership perhaps are confused over the interpretation of the common law conception of authority over wild life. A liberal interpretation of this conception places the ownership in the *people*—not a unit of Government. The

“State” (which in this sense may be either the political unit known as such or the Federal Government) exercises no authority of ownership but merely the authority to determine the rules and conditions under which wild life may be reduced to possession by individual citizens. Under such an interpretation it would be difficult for a State to maintain the premise that it should exercise the right of ownership over game on the National Forests—or, in fact, that it should exercise any authority over game on Federal lands which it does not claim over timber or forage. If this theory of ownership should prevail, the latent controversy over that issue would be settled and the Federal and State agencies could proceed to develop a rational, co-ordinated program which would serve the public to the fullest possible extent. The Forest Service should welcome the fullest participation by State and local agencies in the harvesting of the annual game crop. The local authorities should gladly assume the responsibility of enforcing all regulations necessary for the maintenance of the resources on the highest sustained yield basis. The Forest Service should be concerned principally with this latter objective under a plan properly co-ordinated with the management of other National Forest resources.

A problem in wild-life management which must be given more consideration than it has received in the past is the extent to which forage may be safely grazed not only by domestic stock but by game as well. On many ranges palatable browse species, succulent weeds and grasses are gradually disappearing from certain areas. The inevitable trend is toward lowered capacity, poorer quality of forage, the breaking down of vegetative cover essential for the protection of the soil, with accelerated erosion and ultimately a desert waste and a menace to the watershed. Everyone will agree that this process must be fully checked whether it is occurring slowly or rapidly. It is so elemental that it sounds trite to list it as a problem. Actually, the process is so insidious that it creeps over the range often unnoticed until irreparable damage is done, or if recognized it is attributed to drought, flood, or other Acts of God, and in too many cases no adequate remedy is applied. We cannot say we have efficient range management until we can demonstrate by actual checks that we are not only maintaining the plants that are established in thrifty condition, but that we are succeeding in establishing adequate stands of reproduction of those plants which we must maintain. Moreover, we are not practicing real range management until we can demonstrate that the vegetative cover is adequate to prevent the further loss of soil through erosion.

Much has been written and will again be written about the possibility or advisability of maintaining a natural balance between competing forms of plant and animal life. It seems to be generally agreed that there is no such thing in nature as a stable relationship between competing forms of life. As in Forest Service work there is a constant series of surges and recessions. Man has contributed immensely to this disturbed relationship. To maintain his position of dominance he must continue to tip the scales to his advantage. Doubtless he should control predators, diseases, parasites, eliminate or reduce to impotency undesirable species of plants and animals, and through breeding and selection improve the quality of desirable species. In addition he should improve the

habitat and food supply of desirable species. This, it would seem, is an essential part of a program whose objective is "highest use."

We need better technique in managing our wild-life resources. The technical biological bureaus of the Government, such as the Bureau of Fisheries, Biological Survey, Bureau of Plant Industry, and the Bureau of Animal Industry, are furnishing invaluable information and advice for facilitating management. Our effort is to apply more of this information and technique. For example, in fish culture instead of dumping fry into unimproved waters we are concentrating efforts on building rearing ponds and damming little streams, affording mechanical protection and shade, increasing the food supply in streams and lakes. We are beginning to eradicate the hosts of injurious larvae that prey upon game animals. We are establishing more small havens for birds and game animals instead of large refuges as a means of effectively increasing the supply. We are improving the quality of game animals through more careful selection of animals to kill.

This article has described a few of the conditions and problems confronting wild-life management on the National Forests and has indicated some of the broader policies that should be given consideration in management. There is a big field for a discussion of more concrete and specific problems which no attempt here will be made to cover. A suggestion is presented in the following outline of the scope and division of responsibilities within the Forest Service organization for wild-life management, and the special personnel needed to assist the administrative personnel in conducting this work.

Scope of Responsibilities of Different Officers in Wild-Life Management **The Forester**

1. Obtain definite legal interpretation of responsibilities of Forest Service over administration of wild-life resources on National Forests.
2. Negotiate with State agencies for a workable basis of co-operation upon which management of wild-life resources on the National Forests can be co-ordinated with management on State and private lands so as adequately to develop and conserve wild-life resources and meet the public recreational needs as fully as possible.
3. Co-operate with official and advisory land-use planning agencies in developing a broad land-use and recreational program into which the management of wild-life resources would fit.
4. Co-operate with scientific bureaus and agencies responsible for or engaged in biological research for information which will provide a sound basis for managing wild-life resources. Such agencies include the Bureau of Fisheries, Biological Survey, Bureau of Animal Industry, Bureau of Plant Industry, Carnegie Institute.
5. Outline policies under which wild-life management will be correlated with the use of forage resources by domestic animals, and how both

will be subordinated to the primary needs of conservation of the soil and watershed values.

Regional Foresters

1. Supervise the administration of wild-life resources on the several Forests.
2. Under policies outlined by the Forester, co-operate with State agencies and regional representatives of Federal agencies in developing recreational and wild-life programs to fit the particular needs of the Region.
3. Direct the necessary administrative investigations to obtain the facts required to apply sound management principles to local problems.
4. Direct recreational and wild-life resource surveys on the individual Forests and the development of management plans for these resources properly correlated with plans for other resources.
5. Arrange with Biological Survey, Bureau of Animal Industry, and other agencies concerned, for the necessary control of predators, diseases, parasites, etc., on the different Forests.
6. Arrange with State game officials for needed refuges; adequate ranges to supplement the National Forest food supply; suitable open seasons and programs for removing the annual crop of game animals and fish on each Forest.

Forest Supervisors

1. Conduct recreational and wild-life surveys for each Forest.
2. Develop and administer suitable management plans.
3. Conduct local administrative studies to obtain information essential to proper management of wild-life resources.
4. Under Service and Regional policies, co-ordinate use of forage by game and domestic stock.
5. Determine the numbers of each species that should be removed each year.
6. Report each year the specific problems in wild-life management and the action needed to overcome them. When recommendations are approved they should be incorporated in the management plans.

Organization Needed to Manage Wild-Life Resources Efficiently **Forester's Office**

Director of Wild-Life Management for the Service.

Regional Office

Director of Wild-Life Management for the Region.

Forest Supervisor's Office

Specially trained biologist and range management man. Initially such an officer should be assigned to a group of Forests varying in number from two to four, depending upon the importance and complexity of the problems.

REVIEWS

Wild-Life Conservation: Report from Senate Committee on conservation of wild-life resources, January 21, 1931.

This Senate report on wild life contains a great deal of information that is of interest to you, and since it was not given general distribution I will try to pass some of it on to you. The attitude and the indicated trend is perhaps more important even than the direct information. The discussion is very largely confined to game, although the subject, wild life, is broader, but it does recognize the distinction between game and wild life.

Another thing that impresses me is that while it is recognized that management consists in so manipulating factors as to increase the *yield*, most of the discussion is concerned with protection and the increase of *numbers*. There is a big difference. Where reasonably protected, numbers increase very rapidly and soon reach the normal carrying capacity of the area. Then the numbers themselves become a problem. I know of no important exception to the tendency to overemphasize increase in numbers, and no important management movement where it has not been overdone to the detriment of both the game and its habitat. We should provide food and shelter before we ask the game to multiply. And there is no idea so antagonistic to successful management as the belief that wild land or "nature" necessarily furnishes these things unaided.

The trend which interests me most is indicated by the attitude of the report toward management on Federal lands and toward the ownership of game. The trend as I see it in all literature is definitely toward the ownership of game being vested in the land. That is beginning to be recognized as a necessity if there is to be any real systematic management. This report does not say definitely that ownership does or should go with the land, but it does say that game can be made a desirable byproduct of the farm, and that "Recent discussions all indicate a better understanding of the relation of the farmer to the ownership of game." Also it says, "The States must cope with this problem of the thought that game belongs to the land"

The statements with regard to the relationship between the States and the Government on nationally owned land are not so clearcut as one would wish, but they do suggest to me a decided trend toward recognition that authority must necessarily go with responsibility. It does in industrial management, so why not in game management? That there are responsibilities—obligations—the report is emphatic enough. For example, it says the Forest Service "has obligations to the Federal program of wild-life conservation that are both direct and indirect." "Also, in the administration of the national forests this service, in co-operation with the States, has direct obligations in the management of game, including the use of range and forage crops and the distribution of surplus stocks of big-game animals for restocking other areas." "It is clearly the function of the Federal Government to practice game management on the national forests, subject to the laws of the State, because they are already under Federal administration." "The Federal Government should set

an example on its own forests to show that the control of the kill, as well as the control of environment, is necessary for proper game management." "The committee is of the opinion that the Forest Service should be equipped and prepared to carry out successful administration within its own resources if local aid is lacking." And also, "On Federal lands the Federal Government should conduct its own game-cropping operations."

The above quotations are chosen from various parts of the report. They are not listed in the order in which they occur. Possibly my arrangement over-emphasizes a single idea. My purpose is merely to show a trend in our thinking that comes out all through this report and is beginning to creep into other game literature. It is the same idea that seems to pervade all our thinking these days—the need for Federal leadership and action. We are going forward all along the line.

Among other things of interest, the report shows that 13,000,000 people either fished or hunted in 1930, and that they spent, while doing so, at least \$650,000,000, not including transportation. While the chief objective in both fishing and hunting is sport, the cash value of the fur and food obtained was \$150,000,000. The thirteen million who hunted represents only about a fourth of the forty-five million recreationists who were interested in and enjoyed the wild life. To perpetuate this source of recreation the States and the Federal Government together appropriate annually about twelve million dollars.

The report divides game into four classes: farm game, forest and range game, wilderness game, and migratory game. The first two classes are readily understood, but just what would be included in the third group is not so clear. It includes, "Species harmful to or harmed by economic land uses," and therefore suited only to wilderness areas in parks or forests. Any species, it seems to me, is harmful to or is harmed by some form of economic use, but no one species is harmful to all uses. Coyotes are or may be harmful to the use of an area for grazing sheep but would not seriously interfere with its use for the production of railroad ties. However, this is a controversial point, as shown by the Senate committee hearings on Alaska bear.

"There is an essential difference between forest game and farm game in the means available for getting management measures into practice. Forest and range lands are often sufficiently low in price to permit of public ownership. Public ownership often is necessary in any event to conserve timber, watershed, and recreational values."

"Management of forest and range game boils down to getting—

"(a) Public acquisition of the greatest possible area of forest, watershed, and game lands, and the practice of game management and public shooting on all of them.

"(b) Facts on how to modify silviculture and range management to produce a game crop, and how to make it help carry the primary crop."

This also, it seems to me, might be considered a controversial point. Hunt-

ing clubs now do own large areas which they improve and protect just for the game. Might it not be cheaper in some cases to lease the hunting rights on a commercial forest? The committee thinks not, and they gave the question a great deal of study. But the reason they give is that private forest land is exploited and not "cropped." That was true away back in 1930, but times have changed—I mean, are changing. When the lumber code gets in its work there will be cropped forest land; cropped for timber, and possibly also cropped for game.

One other thing is of interest, which I think I have mentioned elsewhere. The report says that "Congress should furnish one game manager for each national forest." You will notice that it does not say one "game expert" or "one game research specialist"; it says one game "manager." The reason Congress should make this special provision is not that the men on the job are not qualified, but that to do the things they know should be done for game, forces them to slight their other duties. There should be someone whose duty it is to manage game. As for research, it is definitely stated that this is a function of the Biological Survey, and that there should be no duplication of effort.

This report was prepared by Senator Harry B. Hawes as a special report covering only one phase of their studies. It was, however, signed by each member of the committee.—P. K.

The Mechanism of Game Management: Chapter II from "Game Management,"
by Aldo Leopold, published by Charles Scribner's Sons.

In chapter one, Leopold has said that management consists in the purposeful manipulation of the environment. He has said also that the tools the manager uses are the same tools which in the past have frequently destroyed game—the axe, the gun, the plow, the cow, and fire. Excepting the gun, these are pretty much the tools of a forester. The forester goes into a young mixed stand with his axe and so modifies the environment of certain chosen trees that they produce a larger yield in a shorter time. At the same time he has modified the food supply for game; whether for better or worse would depend on other factors and the kind of game.

But why manipulate? If left alone will not the game take care of themselves and increase? One pair of quail under ideal conditions will have increased to more than a thousand by the end of the third year. Two thousand deer, such as many of you have on your Forests, if uninterrupted will have become five million in twenty years. What more do you want? But some of you have had two thousand for the last twenty years and they are still two thousand. If so, what is happening? Two thousand adult deer will produce fifteen hundred each year. If the total does not increase, it means that fifteen hundred are each year killed by one means or another. Some may be killed by hunters, some by lions, some starve, some die of disease. What management tries to do is to take them away from other enemies and give the whole fifteen hundred to the hunters. It never does quite get them all.

These environmental factors which affect numbers are classified into direct

factors and influencing factors. Predators kill game direct, but if food is scarce and the game is weak, they kill more of it. Likewise a hunter kills direct, but if there is an abundance of good cover in which the game can hide, he will not kill so many. Hence the hunter is a direct factor affecting the productivity of game and the cover is an indirect or influencing factor.

All game must have food, water, cover and other special factors not so well understood. Just as you eat spinach for vitamins, it is probable that all game needs certain vitamin foods. Possibly they also need certain minerals—salt, for example—and most birds require gravel. If all gravel is covered by snow, the birds may starve even with feed available. Some birds need a dust bath occasionally and do not thrive without it. If it is dust they need it does not help much to shorten the open season. Better to give them dusting places.

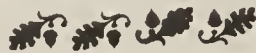
The direct or decimating factors are hunting, predators, starvation, disease, and accidents; the indirect or welfare factors are food supply, water supply, coverts, and special factors. These factors, of course, do not act independently but are all closely related. If there is no winter cover the hawks get the quail. Or if there is not enough food, the quail become weak and are taken by the hawks even though there is good cover. The hawks are getting the quail so you put a bounty on hawks, pay for having them killed and let the quail starve. And then when you find the quail starved, place further restrictions on hunting. At least that is the way it frequently has been done in the past.

Naturally, all game animals increase very rapidly. This natural increase is retarded by some or all of these nine factors listed above. At some point or other a limit is reached beyond which it cannot increase. If the population is too dense, disease is apt to increase, or the food becomes scarce, or more men hunt. If all factors are favorable, game is plentiful; if none are favorable, the game becomes extinct. But seldom, if ever, are there such extreme conditions. Usually some one or more factors are unfavorable and limit the amount. If there is feed for only a thousand animals, game laws and the trapping of predators are of no avail in going beyond that number. The thing to do is to produce more feed. If predators get the bulk of the increase, then go after the predators and coverts. Improving other factors cannot force the numbers beyond the number allowed by the one that limits. So the thing to do is to find this limiting factor and work on it first. After it is taken care of then some other factor becomes the worst and deserves attention. There is no limit other than these limiting factors, and any number of game animals desired can be had by controlling them. "Game management consists largely of 'spotting' the limiting factor, and controlling it."

Methods used in the control or "purposeful manipulation" of environmental factors are themselves controlled by the cost as compared with results. The difficulties in applying this rule are that relationships are not always direct and values are largely intangible. In game management, for a time at least, manipulations will be slight and inexpensive. But it is often surprising what difference a slight change will make, as, for example, a little feed for the quail just at the critical period in the winter may prevent a great many from starv-

ing. In English grouse an increase of thirtyfold has been brought about by burning spots in the heather. In Pennsylvania extensive lumbering and fire produced great quantities of deer feed, and this, with refuges and restrictions on hunting, produced an enormous increase in deer. Without the feed the law would have been powerless; but it just happens the gun was for the time being the limiting factor; now the limiting factor is feed.

Where values are high, game farming is resorted to, but game farming, while related, is not game management. Game management produces wild game in a favorable environment. Stand improvement work does not change the nature of your white pine; you are just adapting the environment to that nature. So in management you adapt the environment to the nature of the game you want to produce. The game, by nature, quickly responds and fills the area to the limit. This is the idea which must be grasped and held before game management can be made effective: Every area on your forest is now filled with game to the limit. If you want more game, find the limiting factor and work on it. Manipulating the wrong factor gets you nowhere. Rule-of-thumb methods work only by accident.—P. K.



SUGGESTIONS FOR DISCUSSION

This subject of Game Management I find a difficult one, in that there is no established technique, no universally recognized textbooks, and little technical literature. Yet it interests more people today than probably any other, outside those related to the depression and recovery. A newspaper study of news values showed nearly four times as many people interested in hunting and fishing as in football. The interest seems to be decidedly on the up grade. Four colleges, I am told, are now giving courses in game or wild-life management.

But all that does not help me a bit. I do not pretend to know the subject, and Mr. Rachford is in the field. That leaves me pretty much on my own, and I confess I do not know just where we ought to begin. As usual, I like to start out with a definition so we will all know what we are talking about. Since there seems to be no accepted definition of either game or game management, I am asking you to accept Leopold's definitions, just that we may have some common ground from which to work. These I have given elsewhere. Game includes only animals hunted for sport. This excludes animals not hunted, and animals hunted for fur or meat. Management means the control of game through the "purposeful manipulation" of factors of the game environment. If there is any objection to these definitions, please let's have it, otherwise these meanings of the two words will be standard throughout all our discussions. Further than this, I have elsewhere listed nine factors (also copied from Leopold) with which we are concerned, and which in management we must manipulate. If anyone wants to add additional factors, or subdivide these, please do so.

With these definitions in mind, two questions immediately occur to me. As I remember the National Forests when I worked on one of them, there were

restrictions of various kinds that might impede or prevent manipulations. An environment consisting of a million acres of wild mountain land may offer resistance. So may uniformed public opinion or unintelligent State laws, if there are such. The Senate Report on wild life mentioned another obstacle. So my first question is:

1. Which factors can be manipulated under normal National Forest conditions?

This may differ in different regions or on different Forests. All factors, I think, are being manipulated more or less on all Forests, but not all purposefully for a game purpose. For example, every fire manipulates the food supply of some or all game in the area. Some say feed is increased by the fire and some say decreased. All agree that it is changed. Likewise with every timber sale and each grazing permit. These manipulate a factor, but our purpose is not to control game, so it is not game management.

2. What information do we need about each game animal if our manipulations are actually to improve the environment for game?

The articles reviewed all indicate that manipulating the wrong factor may do harm or, at least, not do any good. Putting out feed for quail on a range where winter cover is needed will not bring the quail through the winter. It just fattens them for the predators. And State laws which limit hunting, but allow a farmer to feed 62 deer to his hogs in one year, may contribute to the food supply (pork) but not to sport. What do we need to know to make our management effective and prevent mistakes?—P. K.

DISCUSSION OF LESSON 20

Rangers at Supervisors' Headquarters

We have quite a number of discussions this time, but not enough, I fear, to influence policy. While all of you are abnormally busy, I presume the real reason that more did not respond is that I failed to make you realize the seriousness of the problem. On the two forests where they were faced with it a year ago they found time to write more than all of you together. I have copies of their letters and memoranda, also the replies, but have not been told that I might publish them. But you will not think it serious until it happens to you. However, it is not volumes of written matter that would count so much as an expression representative of the entire Service. You have given the arguments on one side. What is the other side, and what do others think? *Nineteen* individuals are against the idea. Does the nineteen represent the majority?

VICTOR H. FREY

ARAPAHO

HOT SULPHUR SPRINGS, COLORADO

1. The ideal location of ranger headquarters is in a small town adjacent to this district. Here he is able to come in daily contact with many more people than if he were located at some far-away ranger station. This makes it possible to transact all lines of his duties more efficiently and quickly because users and permittees make frequent trips for mail and supplies to a community center of this nature; it also frequently happens that a number of them live in the town. The ranger becomes better acquainted with the citizens in that locality, and he can secure better co-operation, especially along fire lines. If you were engaged in any kind of a business would you prefer to be located at some isolated place or in a small community of this nature?

By having the ranger located in a small town near his district the Forest Service saves the expense of keeping up all improvements on a year-long station. The ranger benefits by having modern conveniences in the way of electric lights, school facilities, better telephone facilities, and social activity. This should increase the quantity and quality of his work. I think the time has come when we should look at this as a business proposition, and not to consider the Ranger as some superhuman person, stationed far away in the hills, part of his work being to snowshoe 10 to 20 miles several times each month for mail and supplies. This, of course, may apply to some forests but not to others. As to our own local situation, all of these small towns are now keeping roads cleared of snow during the winter months, but if a ranger is located off the main highway, it is difficult to travel.

2. There is no particular benefit or desirability of having even one ranger stationed at the Supervisor's office. If it so happens that his district is immediately adjacent to the town where the Supervisor is located, then it is all right to include his quarters with the Supervisor's office. As to having several rangers located there, well, I feel that they should be stationed in small communities adjacent to their own districts for the following reasons: It would save much travel expense and time, not only for himself, but for all users and permittees;

he becomes better acquainted, and is one of the community, thereby securing much better co-operation in all lines of forestry work. One of the main points not to overlook is the prevention and suppression of fires. If a ranger is located in a small town near his district, I would say that he would get nearly 100 per cent quicker action on all fires. Of course, he is much nearer to all lines of his work than if he were stationed at the Supervisor's office.

3. From the foregoing discussion, I think you can readily see that I would not favor having the rangers located at the Supervisor's headquarters. From past experience, I can truthfully say that there is somewhat of a tendency for any ranger to depend pretty much on the Supervisor's office rather than his own initiative. This is very noticeable along accounting lines, as the preparation of purchase orders, keeping accurate record of his allotments and expenditures, and it may also be applied to grazing problems. Then there is the problem of permittees calling at the office. When a ranger has his office in with the Supervisor's quarters, this increases the Clerk's work materially at times. Permittees will call and the Ranger is out; they then sit down and tell all their troubles to the Clerk (if Supervisor is also away). Frequently this happens right at rush times when reports and mail should be on their way. Well, one must be a diplomat to get out the required work and at the same time not offend the permittees. This is a problem worth considering if we had several rangers on hand. However, the big issue to me is this: A ranger has one large unit of more than 100,000 acres of Uncle Sam's land to administer and watch carefully. Is it not common sense to assume that he can do the job better by being near and adjacent to it rather than a good many miles from it? We have timber trespass cases, grazing trespass, game violations, and we all realize that speed and action are necessary for forest fires. Yes, I would say Uncle Sam might feel just a little easier to have his representative right on the job, near at hand. As to the argument for eliminating expenses, cutting down overhead, etc., well, one bad fire could easily wipe out all of the accrued advantages of this nature. And this one bad fire might easily occur on account of the ranger being stationed at the Supervisor's headquarters.

K. WOLFE

FLATHEAD

KALISPELL, MONTANA

When all rangers are provided with airplanes that can land almost anywhere, and when radio is perfected to the point where completely satisfactory communication can be maintained between the rangers and their temporary employees at any and all times—then I'll vote in favor of a "general policy" of having Ranger headquarters in the same towns with the Supervisor's headquarters. In the meantime, on most of the Forests in Region One, there really isn't any question to vote on. That is, if we are talking about Rangers whose jobs are anything like those with which we are acquainted now.

In the comparatively few cases with which I am acquainted where the Supervisor's headquarters town is located near enough to the territory making up a ranger district to make it feasible from a transportation and communication standpoint for the ranger to handle his job from that headquarters, I'd

vote in favor of having the ranger's and Supervisor's headquarters in the same town. Why? Primarily to reduce the cost in time and money of maintaining separate set-ups. Especially is this true in the winter time, when shoveling snow, getting wood for the office, etc., etc., take a large part of the time of a ranger who is wintering at his station out in the sticks.

A closely related but more important point as I see it is the *number* of headquarters that should be maintained. Efficiency of administration should increase as the number of units into which a Forest is divided increases. The cost should decrease as the number of units is decreased. Our old friend, the happy medium, will give us satisfactory administration at a reasonable cost. All we have to do is to find out where the proper division point lies.

DONALD E. CLARK

ARAPAHO

HOT SULPHUR SPRINGS, COLORADO

3. My vote is against locating all rangers on a forest at the Supervisor's headquarters, as a general policy.

I favor the general policy of locating rangers in community centers with schooling facilities on or adjacent to their districts; communities which are business centers for a large proportion of the local users of such ranger districts. By this method the expense of maintaining complete ranger headquarters plants can usually be eliminated. The rangers would be so located that many, if not most, of their users would be able to do business with them at a point where the users ordinarily go to secure mail and supplies and to do other business. The expense of maintaining telephone lines and roads to many stations would be eliminated. Yet, in most cases, the rangers would be so located as to be able to handle their fire situation more effectively than if located at a distant Supervisor's headquarters.

Travel expense and time would ordinarily be much less. Supervisor's headquarters may, in many instances, be the community business center near one or several ranger districts, but the rangers should be located there for that reason and not the fact that it is the Supervisor's headquarters. On the average, rangers at Supervisor's headquarters would be apt to become more dependent upon the Supervisor, tend to be less responsible, and develop less initiative. Under the present organization, resulting from the recent consolidation and enlargement of ranger districts, our public relations have suffered. To move all rangers into the Supervisor's headquarters would cause such relations to further suffer. This, I feel, is one of the most important factors to be considered.

The United States is apparently headed toward a six-hour day in an effort to make an equitable spread and stabilization of employment. If this is accomplished in private industry, the Government will probably eventually follow suit. Year-long employment is more stable than seasonal. This will probably throw the program of consolidation into reverse and lead to smaller units of forest administration again, with rangers located in or near by a large number of small forest communities. It does not appear logical that this program

would fit in with one allocating all rangers at a Supervisor's headquarters.

The business of administering and protecting the forests is organized at present with ranger districts as the basic units. A ranger's business should be primarily with the forest users, not with the Supervisor's office. Accordingly, he should be so located as to be able first to most effectively handle that business, rather than to be able to help the Supervisor handle his job. If the forest should become the basic unit of administration, then the Supervisor would become the administrator, with his assistants or staff (and no district rangers) quartered at his headquarters. However, I believe that we generally agreed a year or two ago that this type of organization is not suited at present to most forests.

T. E. PRICE

SAN JUAN

DURANGO, COLORADO

At the present time I haven't sufficient time to attempt to write any fair discussion on this important question, but hurriedly looking back over my past experiences in the Service I am strongly in favor of having the ranger stationed in towns or communities on or near their respective districts, and also decidedly against locating them in the Forest headquarters town.

STANLEY F. WILSON

REGIONAL OFFICE

ALBUQUERQUE, NEW MEXICO

Other things being equal, I am somewhat against having rangers at Supervisor's headquarters. It is rather hard, however, to definitely vote as I have indicated. Calkins says:

"If you bring all rangers into Supervisors' headquarters, regardless of location with respect to districts, the tendency is to get away from the ranger district form of organization. I am for bringing the ranger into town if necessary in order to avoid depriving him of school facilities and other obvious advantages that make the job reasonably attractive. If the appropriate town happens to be the Supervisor's headquarters town, O. K."

It seems to me that that about meets the situation.

H. H. HERNDON

HELENA

HELENA, MONTANA

I will take time to briefly set down some of my views relative to moving rangers into the Supervisor's headquarters as a general rule.

It would be a very definite step towards centralization which I would not favor. We have to keep in mind the attitude of the people with whom we deal in the management of the Forests. I do not believe they would favor it, because I already have heard opinions expressed adversely to our consolidations that have been made. I believe that in the long run the opinion of the people living in the vicinity of the Forests should govern quite largely, and that what they want will be in a measure our standard of good business management.

The attitude of the employee who has the administration of a large area

from a distant headquarters becomes necessarily more or less detached and general. As long as someone has to attend to and be responsible for all of the various details in the field this should be guarded against. I do not believe it good business, and wish to vote decidedly *against* such a tendency. I personally lean the other way.

P. V. WOODHEAD

ROUTT

STEAMBOAT SPRINGS, COLORADO

As to the economy factor, a detailed analysis would be necessary in order to compare travel costs. On Forests where all offices are rented, there would probably be little difference in the rental expense. Other controlling factors are climatic and geographical conditions, and centers of Forest-using population. These three factors should be given the most weight in deciding the location of rangers' headquarters, excepting—if my guess about costs is near the mark—those rare instances where there is really a great difference in costs between two or more towns. If the answer, when worked out, indicates that one or all rangers should be in the same town with the Forest Supervisor, that is where they should be stationed. Numbers do not make any difference, but the other conditions do, and should govern with our present form of organization. If we had a purely functional field organization, all of the personnel on a Forest would work out of one office, just as the regional and Washington personnel do.

Therefore, as I understand your question, I vote against a general policy of stationing rangers in the same town with Supervisors.

PAUL D. IRWIN

SAN JUAN

DURANGO, COLORADO

The question of a ranger headquarters location has always been a point of interest. I have always been, and am still of the opinion that a ranger should be located in the community on his district where he can transact business with the users at any and all times without the necessity of them traveling to some distant town. Not all users can take the time, and also have the money to travel at long distances to transact their business.

As to efficiency in handling the business of the district, I think it is much easier for the ranger if he is located on his district, with his telephone connections, as nearly all stations are connected by telephone, no matter how remote the location may be. If the headquarters is in some distant town during the winter, the traveling expense will be much greater going to and from his work.

I have always said that every ranger should have his turn working in the Forest Supervisor's office to acquaint them with the way the work is handled; it not only teaches them to be more prompt with their office work, but it teaches them to do better work and get their work in a more complete form, and furthermore be on time with all reports.

I think it would be poor policy to have three or four rangers at the Supervisor's headquarters at one time; not enough work for that many at a time. A ranger with nothing to do but his own office work would be idle about half of the time if located in some place other than out on his district unless furnished with work in the Supervisor's office.

1. It is, in my opinion, best to keep rangers' headquarters in towns or communities other than the Forest headquarters. By having headquarters in various towns within or adjacent to the Forest, the Service is much better represented over a wide area; permittees and others are able to meet with Forest officers and discuss forest problems without making trips to headquarters towns; and rangers become less dependent on the Supervisor's office for help.

2. Numbers do make a difference. A Supervisor's office crowded with a number of rangers would result in inefficiency on the part of each member in the office. Time would be lost and, above all, the general public would not understand why every Forest officer on any Forest should be in town. A large number of Forest officers in any town would result in criticism by the general public.

3. As a general policy I vote against rangers at Supervisor's headquarters, but realize that there are exceptions to the rule. I do not hesitate to use rangers at the Supervisor's headquarters during winter periods, either for the rangers' good or benefit to the Service, and there are no doubt some individual cases on certain Forests where one or more rangers should be located in Forest headquarters towns.

J. N. TEMPLER

HELENA

HELENA, MONTANA

1. The answer to Question 1 is Yes because of:

The more rangers stationed at Forest headquarters the greater the confusion in employing labor for fire suppression and other work. The tendency to hire labor at the Forest headquarters rather than that available on or nearer the ranger district inevitably leads to delay, criticism and loss of co-operation when most needed.

Possible loss of initiative by the ranger personnel, where they are stationed in the same suite as the Forest headquarters.

Probable increase in travel time and subsistence costs without any compensating gain.

Possible loss in morale due to higher living costs, loss of prestige enjoyed in smaller communities and decreased sphere of influence.

Difference in degree of fire hazard between Forest headquarters and the area administered is occasionally so great as to necessitate the ranger being actually on the ground to appreciate hazardous conditions.

The public is entitled to service and advice, which, if the ranger is located at the Forest headquarters, too often is sought from the Supervisor rather than the ranger.

Concentration of the ranger force at the Forest headquarters is apt to lead to a bureaucratic attitude on the part of the personnel, due primarily to

its getting out of personal touch with community problems and thought, i. e., on the area administered.

Ranger personnel is apt to lose sources of information upon which it is more or less dependent.

The smaller communities, which are gradually losing out due to modern transportation methods, depend to some degree on the income derived from the location of a ranger headquarters, while the traveling public depends more and more on the ranger personnel for information, advice, and oftentimes assistance.

Ordinarily business is handled more efficiently near or at the scene of activity.

The public and permittees should have local, convenient service, hardly possible if the ranger force is concentrated at the Forest headquarters.

Much of the respect and trust now enjoyed by the Forest Service is due to the public's estimate of the character and accomplishments of the ranger force "on the ground."

2. In regard to the problem presented in Question 2, in my opinion numbers do make a difference in that many of the objections mentioned above apply to this factor. The more rangers stationed at Forest headquarters the greater the burden imposed on the supervisory staff in conferences with permittees that are purely ranger calibre work. Due, I presume, to long experience with the more "bureaucratic" organizations, the public generally believes in "going to the top" in spite of the fact that most of its business or decisions regarding its business are really determined by the subordinate members of the organization.

3. Answering Question 3, I wish to cast my vote *against* the concentration of rangers at the Forest headquarters as a general policy.